

### **AMENDMENTS TO THE CLAIMS**

The following listing of Claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of Claims:**

Claims 1-35 (Canceled).

36. (Previously Presented) A method of forming a plate for the passage through at least two vertical passages of at least one substance from a first location to a second location comprising the steps of:

(a) providing a plurality of ceramic layers, said ceramic layers comprised of a material selected from the group consisting of alumina, aluminum nitride, and glass;

(b) forming at least two vertical passages arranged in an array of sample cells in a first layer, said at least two vertical passages passing completely through said first layer, with each sample cell containing said at least two vertical passages;

(c) forming corresponding vertical passages connecting to said at least two vertical passages in at least one corresponding layer, said corresponding vertical passages passing completely through said corresponding layer;

(d) forming a plurality of connecting horizontal channels extending in a horizontal direction in a

lower layer disposed below said first and said at least one corresponding layer, in which at least some of said plurality of horizontal channels in said lower layer connect said at least two vertical passages; and

(e) sintering said first layer, said at least one corresponding layer and said lower layer to form a plate containing an array of sample cells containing horizontal and vertical interconnected structures;

wherein at least one of said at least two vertical passages contains removable liners, whereby material adhering to said removable liners may be processed away from said plate.

37. (Previously Presented) A method according to Claim 36, in which said removable liners carries a reagent thereon, whereby in operation said reagent reacts with a component of an applied fluid.

38. (Previously Presented) A method according to Claim 36, in which at least one of said at least two vertical passages is connected to a conduit storing rinsing fluid.

39. (Previously Presented) A method according to Claim 36, in which a material is adhered to an inner surface of one of said at least two vertical passages and said horizontal channel carries a reagent thereon, whereby in operation said reagent reacts with a substance in an applied fluid.

40. (Previously Presented) A method of forming a plate for the passage through at least two vertical passages of at least one substance from a first location to a second location comprising the steps of:

(a) providing a plurality of ceramic layers, said ceramic layers comprised of a material selected from the group consisting of alumina, aluminum nitride, and glass;

(b) forming at least two vertical passages arranged in an array of sample cells in a first layer, said at least two vertical passages passing completely through said first layer, with each sample cell containing said at least two vertical passages;

(c) forming corresponding vertical passages connecting to said at least two vertical passages in at least one corresponding layer, said corresponding vertical passages passing completely through said corresponding layer;

(d) forming a plurality of connecting horizontal channels extending in a horizontal direction in a lower layer disposed below said first and said at least one corresponding layer, in which at least some of said plurality of horizontal channels in said lower layer connect said at least two vertical passages; and

(e) sintering said first layer, said at least one corresponding layer and said lower layer to form a plate containing an array of sample cells containing horizontal and vertical interconnected structures.

41. (Previously Presented) A method according to claim 40, in which said lower layer is disposed above a solid layer forming a bottom surface of said horizontal and vertical interconnected structure.

42. (Previously Presented) A method according to claim 40, in which said lower layer contains said horizontal channels and also forms a bottom surface of said horizontal and vertical interconnected structure.

43. (Previously Presented) A method according to claim 40, in which:  
said steps of forming horizontal channels and vertical passages in said at least one of said first layer, corresponding layer, and lower layer are effected by a material removal technique.

44. (Previously Presented) A method according to claim 40, in which:  
said steps of forming horizontal channels and vertical passages in said at least one of said first layer, corresponding layer, and lower layer are effected by a non-material removal technique.

45. (Previously Presented) A method according to claim 40, in which said lower layer is a removable layer having an upper surface adapted for holding sample materials.

46. (Previously Presented) A method according to claim 40, in which said lower layer is adapted for passing light.

47. (Previously Presented) A method according to claim 40, in which said lower layer is transparent.

48. (Previously Presented) A method according to claim 45, in which said removable layer has a thickness less than 1.0mm.

49. (Previously Presented) A method according to claim 40, in which said vertical passages and a reaction region of structures of passages are adapted such that bubbles rise to a region outside said reaction region.

50. (Previously Presented) A method according to claim 40, in which a first one of said at least two vertical passages contains a surface material having a first attraction for capillary action and a second one of said at least two vertical passages contains a surface material having a second attraction for capillary action.

51. (Currently Amended) A sample-holding plate containing an array of sample cells for the reaction of reagents in at least two vertical passages comprising:

(a) a plurality of ceramic layers sintered together, said ceramic layers comprised of a material selected from the group consisting of alumina, ~~glass ceramic~~, aluminum nitride, and glass ~~and borosilicate glass~~;

(b) at least two vertical passages arranged in said array of sample cells in a first layer, with each

sample cell containing-said at least two vertical passages;

(c) at least one corresponding layer containing sets of corresponding vertical passages connecting to said at least two vertical passages in first layer;

(d) a bottom layer disposed below said first and said at least one corresponding layer and containing a plurality of connecting horizontal channels, in which said connecting horizontal channels connect said at least two vertical passages, thereby forming an array of sample cells containing horizontal and vertical interconnected structures.

52. (Previously Presented) A sample-holding plate according to claim 51 further comprising a first reagent and a second reagent, in which a first one of said vertical passages comprises a restricted portion adapted for storing a quantity of said first reagent; and a second one of said vertical passages is adapted for receiving said second reagent and bringing said second reagent in contact with said first reagent.

53. (Previously Presented) A sample-holding plate according to claim 52, in which said first and second reagents have quantities such that said first and second reagent overlap by a diffusion length of one of said first and second reagents.

54. (Previously Presented) A sample-holding plate according to claim 52, in which the layer that forms the bottom surface of the horizontal and vertical interconnected structure is a removable layer having an upper surface adapted for holding sample materials.

55. (Previously Presented) A sample-holding plate according to claim 51, in which the bottom layer is transparent.

56. (Previously Presented) A sample-holding plate according to claim 51, in which at least one of said at least two vertical passages is connected to a container storing rinsing fluid.